

WHAT IS CLAIMED IS:

1. A balloon catheter comprising:
a flexible elongate body having a proximal portion and a distal portion, wherein the distal portion includes a curved portion terminating in a hooked portion at the extreme distal end, wherein curvature of the hooked portion is greater than curvature of the curved portion;
at least three lumens running lengthwise throughout the body, each having a port of entry at a proximal end thereof;
an inflatable balloon located on the exterior of the body with a distal end of the balloon terminating about 2 to 4 centimeters proximally of the curved portion of the distal portion of the body; and
a port of exit located at a distal end of at least one of the lumens.
2. The balloon catheter of claim 1, wherein the body is about 80 to about 160 centimeters in length.
3. The balloon catheter of claim 1, wherein the body is about 5 to about 7 French in diameter.
4. The balloon catheter of claim 2, wherein the curvature of the curved portion is from about 30 degrees to about 80 degrees.
5. The balloon catheter of claim 4, wherein curvature of the curved portion is about 30 degrees.
6. The balloon catheter of claim 5, wherein curvature of the hooked portion is from about 40 degrees to about 90 degrees.
7. The balloon catheter of claim 6, wherein curvature of the hooked portion is about 65 degrees.

8. The balloon catheter of claim 1, wherein the lumens are independently about 0.025 to about 0.038 centimeters in diameter.
9. The balloon catheter of claim 1, wherein the port of entry to at least one of the lumens comprises a connector selected from the group consisting of connectors for connection of the electrodes to a device for monitoring electrical impulses, for inflation of the balloon and for introduction of media to the lumen.
10. The balloon catheter of claim 9, wherein the connector is for monitoring electrical impulses and the catheter further comprises at least one pair of electrodes located externally on the body and distally from the distal end of the balloon.
11. The balloon catheter of claim 10, wherein the electrodes are located on the curved portion of the body distally from the distal end of the balloon.
12. The balloon catheter of claim 9, further comprising leads running through a lumen and connected between the electrodes and the connector for connection of the electrodes to a device for monitoring electrical impulses.
13. The balloon catheter of claim 11, wherein the device for monitoring electrical impulses is an electrocardiogram (EKG) machine.
14. The balloon catheter of claim 9, wherein at least one of the lumen has a connector for inflation of the balloon and the distal end of the lumen opens into an interior of the balloon.
15. The balloon catheter of claim 9, wherein at least one of the lumen is sized for introduction of a guidewire through the lumen.
16. The balloon catheter of claim 10, wherein a single pair of electrodes is located externally on the curved portion of the distal portion of the body.

17. The balloon catheter of claim 10, wherein two pairs of electrodes are located externally along the curved portion of the distal portion of the body.
18. The balloon catheter of claim 10, wherein , from three to ten pairs of electrodes are located externally along the curved portion of the distal portion of the body.
19. The balloon catheter of claim 1, wherein the balloon is sized to expand to a volume of about 1 cc to about 4 cc when inflated.
20. The balloon catheter of claim 1, wherein the balloon has a diameter of about 5 to about 10 millimeters when inflated.
21. The balloon catheter of claim 1, wherein the balloon is pleated when not inflated.
22. The balloon catheter of claim 13, wherein the port of exit is suitable to introduce a drug or radiopaque or radiographic medium to a subject.
23. A method of mapping a venous structure of the heart, comprising:
 - a) inserting a catheter into a vein of the heart;
 - b) occluding the blood flow in the vein;
 - c) injecting a radiographic medium into the vein, wherein the occlusion of the blood flow causes retrograde flow of the blood and the dye into the surrounding connected venous structure of the vein, including branches of the vein; and
 - d) imaging the veins containing radiographic medium to obtain a map of the vein and the surrounding connected venous structure, including branches of the vein.
24. The method of claim 23, wherein the imaging comprises x-ray imaging, fluoroscopy, computed tomography (CT) or use of a radiation detector.
25. The method of claim 23, wherein the venous structure is the coronary sinus or a pulmonary vein.

26. The method of claim 23 further comprising measuring the electrical conduction pattern of the venous structure and mapping the electrical conduction pattern.
27. A method of mapping a venous structure of the heart, comprising:
- a) inserting a guidewire into one of the lumens of the balloon catheter of claim 1 to form a guidewire-containing balloon catheter;
 - b) percutaneously inserting the guidewire-containing balloon catheter into a vein of the heart;
 - c) inflating the balloon to occlude the blood flow in the vein;
 - d) injecting a radiographic dye into the vein through a lumen of the guidewire-containing balloon catheter, wherein the occlusion of the blood flow by the balloon causes retrograde flow of the blood and the dye into the surrounding connected venous structure of the vein, including branches of the vein; and
 - e) imaging the vein and connected venous structure containing the radiographic dye so as to obtain a map of the vein and the surrounding connected venous structure, including branches of the vein.
28. The method of claim 27, wherein imaging the veins containing radiographic dye is performed by x-ray, fluoroscopy, computed tomography (CT) or radiation detector.
29. The method of claim 27, wherein the venous structure is the coronary sinus or a pulmonary vein.
30. The method of claim 29, wherein the inserting of the guidewire-containing balloon catheter into the coronary sinus is performed by sliding the hooked portion of the catheter through the coronary sinus ostium.
31. The method of claim 27, wherein the catheter has electrodes located externally along the distal end of the body and the method further comprises using the electrodes to obtain a map of the electrical conduction pattern of at least one cardiac chamber or feature.

32. The method of claim 31 wherein the cardiac chamber or feature is selected from the coronary sinus, coronary sinus ostium, pulmonary vein, branches of the coronary sinus, and branches of the pulmonary vein.
33. The method of claim 32, wherein a single pair of electrodes is located externally along the curved portion of the distal portion of the body.
34. The method of claim 32, wherein two pairs of electrodes are located externally along the curved portion of the distal portion of the body.
35. The method of claim 32, wherein from three to ten pairs of electrodes are located externally along the curved portion of the distal portion of the body.
36. A method of locating an aberrant electrical conduction pattern in the heart of a subject, comprising:
- a) inserting a guidewire into one of the lumens of the balloon catheter of claim 10 to form a guidewire-containing balloon catheter;
 - b) percutaneously inserting the guidewire-containing balloon catheter into a vein of interest in the heart of the subject;
 - c) inflating the balloon to occlude the blood flow in the vein;
 - d) injecting a radiographic dye into the vein through a lumen of the guidewire-containing balloon catheter, wherein the occlusion of the blood flow by the balloon causes retrograde flow of the blood and the dye into the surrounding connected venous structure of the vein, including branches of the vein;
 - e) imaging the veins containing radiographic dye to obtain a map of the vein and the surrounding connected venous structure, including branches of the vein;
 - f) using the electrodes of the guidewire-containing balloon catheter to obtain a map of the electrical conduction pattern of at least one of area selected from the coronary sinus, coronary sinus ostium, pulmonary vein, branches

of the coronary sinus, branches of the pulmonary vein and any other cardiac chamber; and

- g) determining a location having an aberrant electrical conduction pattern in the heart of the subject from the map of the electrical conduction pattern.

37. The method of claim 36, wherein the imaging of the veins containing radiographic dye is performed by x-ray, fluoroscopy, computed tomography (CT) or radiation detector.

38. The method of claim 36, further comprising using the map of the electrical conduction pattern of the at least one area to determine a location for placement of a pacemaker in the subject.

39. The method of claim 38, further comprising implanting a pacemaker lead into the subject in the location while the guidewire-containing balloon catheter remains in place.

40. The method of claim 39, wherein the implantation of the pacemaker lead comprises introducing the pacemaker lead through a different percutaneous opening in the subject than the opening through which the guidewire-containing balloon catheter was percutaneously inserted.

41. The method of claim 39, wherein the implantation of the pacemaker lead comprises introducing the pacemaker lead through the same percutaneous opening as the opening through which the guidewire-containing balloon catheter was percutaneously inserted.

42. The method of claim 36, wherein the balloon catheter is inserted into the coronary sinus of the coronary artery of the heart and is inflated to occlude the coronary sinus ostium.

43. The method of claim 42, wherein the inserting comprises using the hooked portion of the catheter body to gain entry into the coronary sinus through the coronary sinus ostium.

44. The method of claim 42, wherein the location is the left ventricle and the implanting of the pacemaker lead is in the left ventricle of the heart.

45. The method of claim 44, further comprising attaching at least one of the pacemaker leads to the pacemaker so as to accomplish biventricular pacing.